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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,644	09/25/2003	Masayoshi Sawai	Q77694	4448

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EXAMINER	
JACOB, MARY C	
ART UNIT	PAPER NUMBER
2123	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/669,644	SAWAI, MASAYOSHI	
	Examiner	Art Unit	
	Mary C. Jacob	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/5/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/4/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-8 have been presented for examination.

Specification

2. The objections to the disclosure referring to the "Brief Summary" are hereby withdrawn in light of Applicant's arguments and further consideration wherein page 2, lines 17-24 is considered to provide an adequate summary of the invention.

3. The objections to the disclosure that refer to the Background of the Invention are held as recited in the first office action. It is noted that Applicant did not amend the specification to overcome the grammatical errors pointed out. Also, referring to the "Background of the Invention" and the recitation of "various wire harnesses described above", the listing of documents alone does not "describe" "various wire harnesses", nor do lines 24-25 recite that the documents listed include examples of wire harnesses.

4. The disclosure is objected to because of the following informalities. Appropriate correction is required.

5. The Background of the Invention is objected to because lines 24-25 state "there are various wire harnesses as described above", however, "various wire harnesses" are not described previous to this, so it is unclear what wiring harnesses are being discussed. Further, page 2, line 1, "also a rigidity" is grammatically incorrect.

608.01(c) Background of the Invention

The Background of the Invention ordinarily comprises two parts: (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions. The statement should be directed to the subject matter of the claimed invention. (2) Description of the related art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A paragraph(s) describing to the extent practical the state of the prior art or other information disclosed known to the applicant, including references to specific prior art or other information where appropriate. Where applicable, the problems involved in the prior art or other information disclosed which are solved by the applicant's invention should be indicated. See also MPEP § 608.01(a), § 608.01(p) and § 707.05(b).

Claim Objections

6. The objections to Claims 1,5,7 and 8 are hereby withdrawn in light of the amendments to the claims, filed 11/8/06.

Claim Rejections - 35 USC § 112

7. The rejections of Claims 1-3, 5-8 under the second paragraph of 35 U.S.C. 112 are hereby withdrawn in light of the amendments to the claims, filed 11/8/06.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama et al (US Patent 6,961,683) in view of Neul et al ("A Modeling Approach to Include Mechanical Microsystem Components into the System Simulation", Proceedings of Design, Automation and Test in Europe, pages 510-517, 23-26 February, 1998) and Peterson et al ("Application of Dynamic System Identification to Timber Beams", Journal of Structural Engineering, April 2001, pages 418-425).

10. As to Claims 1-8, Kodama et al teaches: a method of assisting a wiring design of a wiring structure comprising the steps of: (Claims 1, 5, 7, 8) regarding the wiring structure constituted by a plurality of pieces of line streak members as an elastic body having a circular section, the elastic body having a plurality of beam elements coupled with each other (Figure 1, column 5, lines 46-48; Figure 5, column 7, lines 16-25; Figure 8, column 13, lines 10-16); applying information concerning a shape characteristic (column 10, lines 29, 48-50), and a constraining condition of the wiring structure as a predetermined condition, wherein the constraining condition is defined by coordinates of respective apexes of the plurality of beam elements and degrees of freedom at the respective apexes (column 10, lines 30-32, 38-40; column 11, lines 16-22); calculating a predicted shape of a displaced wiring structure such that the predetermined condition is satisfied (column 11, lines 44-63); outputting the calculated predicted shape (Figure 7, element S7); and (claim 3) wherein the wiring structure is a wire harness wired to a vehicle (column 1, lines 17-27).

11. Kodama et al does not expressly teach (claim 1) a linearity of the plurality of beam elements being maintained; (claim 1) the finite element method; (claim 1) calculating a characteristic value with respect to vibration for the calculated predicted shape and outputting the calculated characteristic value, (claims 2, 5, 6, 7, 8) wherein the characteristic value includes at least one of a natural frequency and a natural vibration mode, (claim 3) the shape characteristic is defined by a sectional area and a length of the beam element of the wiring structure; (claim 3) a material characteristic wherein the material characteristic is defined by a moment of inertia, a polar moment of inertia, a density and a longitudinal modulus of elasticity and a transverse modulus of elasticity of the beam element; (claim 4) analyzing a characteristic value with respect to vibration for the predicted shape and outputting the results of the analysis.

12. Neul et al teaches the analysis of mechanical components based on finite element analysis using spatial beams (page 511, Section 2, paragraph 1; page 512, column 1, lines 4-17) that gives an accurate description of the static and dynamic behavior of linear spatial beams as well as more complex configurations constructed from those beams (Conclusion); wherein linearity is maintained among the beams (page 514, column 2, last paragraph-page 515, column 1, lines 1-3); wherein the properties of a beam element is determined by properties of its material characteristics including density, moment of inertia, polar moment of inertia and modulus of elasticity, and shape characteristics including length and cross sectional area, moment of inertia and polar moment of inertia, wherein the displacements contained in x are denoted by w and the torsions by φ (page 512, column 1, lines 20-30). Further, Neul et al teaches verifying the

dynamic properties of the models by calculating the natural frequencies of a beam, the vibrations in a beam and determining the shapes vibration in the beam (page 515).

13. Peterson et al teaches a technique using an experimental modal analysis and a damage localization algorithm of a structure that can identify the location of even small magnitudes of simulated damage within a beam model (Conclusions, sentences 1-2). Peterson et al teaches calculating a characteristic value with respect to vibration for the calculated predicted shape and outputting the calculated characteristic value, wherein the characteristic value includes at least one of a natural frequency and a natural vibration mode, analyzing a characteristic value with respect to vibration for the predicted shape and outputting the results of the analysis (page 422, column 2, lines 3-17) wherein the natural frequencies and mode shapes are determined (page 419, column 1, paragraph 4, first sentence; page 419, column 1, paragraph 5, last sentence; page 419, column 1, paragraph 6-column 2, lines 1-5); finite element analysis used to calculate modal parameters; and material characteristics including a longitudinal modulus of elasticity and a transverse modulus of elasticity of the beam element (page 421-422, "Analytical Verification of Damage Localization Algorithm", paragraph 1).

14. Kodama et al, Neul et al and Peterson et al are analogous art since they are directed to the modeling of a mechanical component through the use of a beam model.

15. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of assisting a wiring design of a wiring structure as taught by Kodama et al to include finite element analysis, the maintenance of linearity, the material characteristics, shape characteristics, and the calculation of

natural frequencies and vibrations in a beam as taught by Neul et al since Neul et al teaches the analysis of mechanical components that gives an accurate description of the static and dynamic behavior of linear spatial beams as well as more complex configurations constructed from those beams (Conclusion).

16. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of assisting a wiring design of a wiring structure as taught by Kodama et al to further include the material characteristics, the calculation and output of a characteristic value including a natural frequency and natural vibration mode as taught by Peterson et al since Peterson et al teaches a technique using experimental modal analysis and a damage localization algorithm of a structure that can identify the location of even small magnitudes of simulated damage within a beam model (Conclusions, sentences 1-2).

Response to Arguments

17. Applicant's arguments filed 11/8/06 have been fully considered but they are not persuasive.

18. Applicant argues: "Kodama does not suggest considering the wiring structure as an elastic body having a circular cross section. Further, Kodama does not suggest the elastic body as having a plurality of beam elements that are coupled to each other" (page 9).

As to the above argument, Kodama considers the wiring structure as an elastic body having a circular cross section in Figure 1 which shows a wire harness, wherein it

is further understood by the description of Kodama of what is known in the art (column 1, lines 22-27; Figure 2 and description) that a wire harness has a circular cross section. Kodama teaches (Figure 5; column 7, lines 16-25) considering the wiring structure as an elastic body having a circular cross section wherein the elastic body model is shown, having a circular cross section, that is used as a model the forces, F and moments, E for portions of the wire harness that is being designed. Further, Kodama teaches the elastic body as having a plurality of beam elements that are coupled to each other (Figure 8; column 13, lines 10-16) wherein the wire harness is an elastic body since it is known and taught that the wire harness is flexible, and is made up of the coupling of wire harnesses 1-5, which are considered beam elements. Figure 8 of Kodama was considered to teach the wire harness and "beam elements" as described by Figure 3C, in the specification.

19. Applicant argues: "While Kodama inputs several pieces of information like thickness, length, etc, there is no suggestion that any shape characteristic is input" (page 9).

As to the above argument, Kodama teaches the input of parameters such as the thickness (diameter) of the wire harness and the length of the wire harness to be used in the shape calculation (column 10, lines 29, 48-50). The diameter of a wire harness would indeed be a shape characteristic specifically because it indicates that the wire harness is circular. Further, since the diameter and length are input as parameters to be used in the calculation of the shape of the wire harness, it is understood that these

parameters are "shape characteristics" since they are used to define the shape of the wire harness.

20. Applicant argues: "Specifically, the Examiner has not shown that the combined teachings of Kodama, Neul and Petersen suggest the invention as a whole including at least the limitations that are discussed above" (page 10).

As to this argument, "at least the limitations that are discussed above" was interpreted to be referring to the discussions of limitations allegedly not taught by Kodama on page 9 of the arguments. Because Kodama does teach the limitations discussed in these arguments, as discussed further in the paragraphs above, it is held that the combined teachings of Kodama, Neul and Petersen do suggest the invention as a whole.

21. Applicant argues: "Claim 4 requires the wiring structure to be constituted by a plurality of line streak members and predicting a shape. Further, it requires analyzing a characteristic value with respect to vibration for the predicted shape. The combined teachings of Kodama, Neul and Petersen do not suggest these features".

As to this argument, Kodama teaches "the wiring structure to be constituted by a plurality of line streak members" (Figure 1; column 5, lines 46-48; Figure 8; column 13, lines 10-16) wherein the wire harness as a whole is made up of individual wire harnesses, or "line streak members" as further discussed above with respect to the arguments regarding "beam elements". Kodama teaches, "predicting a shape" (column 11, lines 44-63) wherein the shape of the wire harness is calculated and displayed. Neul teaches the calculation of the vibrations in a beam to verify the dynamic properties of

the models, therefore, analyzing the vibration in a modeled shape for a model containing beam elements. Further, Petersen also teaches calculating a characteristic value with respect to vibration for a calculated predicted shape and analyzing this value (page 422, column 2, lines 3-17). Due to the teachings in both Neul and Petersen, the combined teachings of Kodama, Neul and Petersen suggest the features of analyzing a characteristic value with respect to vibration for a predicted shape.

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C. Jacob whose telephone number is 571-272-6249. The examiner can normally be reached on M-F 7AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Mary C. Jacob
Examiner
AU2123

MCJ
1/5/07

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